JET PROPULSION LABORATORY INTEROFFICE MEMORANDUM

September 16, 2004

TO: G. Burke

FROM: S. Guduru

SUBJECT: Updated Venus Express Loading Study

REFERENCE: Preliminary Venus Express Loading Study by S.Lineaweaver dated 01/16/04.

This study is an update to the study performed in January 2004 for the Venus Express (VEX) mission. It evaluates the effect of Stereo-A and Stereo-B launch requirements on the current supportability of the VEX Mission.

Analysis was accomplished using the FASTER (forecasting and scheduling tool for earth-based resources) forecasting system and the updated mission set database after August 2004 Resource Allocation Review Board (RARB) meeting.

Summary

Venus Express will receive above 90% of the requested time on an average during the period of STA and STB launch through VEX Venus Capture (weeks 06 – 17, 2006) except in week 09 where the supportable time falls below 85%. It has contention with requirements supporting SOHO Antenna Keyhole and MSGR cruise on the 34-meter subnet.

Assumptions

STA and STB launch on 02/11/06.

Updated View periods provided by the project are used for the assessment.

The User Loading Profile (ULP) used for the study is as shown in Figure 1.

Assessment

The study focuses on the period from February 06 through April 30 of 2006. This system models the negotiation process and uses event-based priorities. Therefore, all impact analyses are simply the differences to the baseline mission set with and without the STA and STB missions.

Figure 1 shows the mission events plotted on the User Loading Profile (ULP) with hours requested expressed as passes per week. The colored area highlights the time period on which this study is focused.

Figure 2 shows the supportable percentage of time that VEX can expect to receive from week 06 through week 17 of 2006. It is expected to receive above 90% during this period except in week 09 where the supportable time falls below 85%. VEX is in contention with requirements

supporting SOHO Keyhole and MSGR cruise on the 34-meter subnet. It has 75% overlap with SOHO and 80% overlap with MSGR view periods.

Figure 1 **User Loading Profiles**

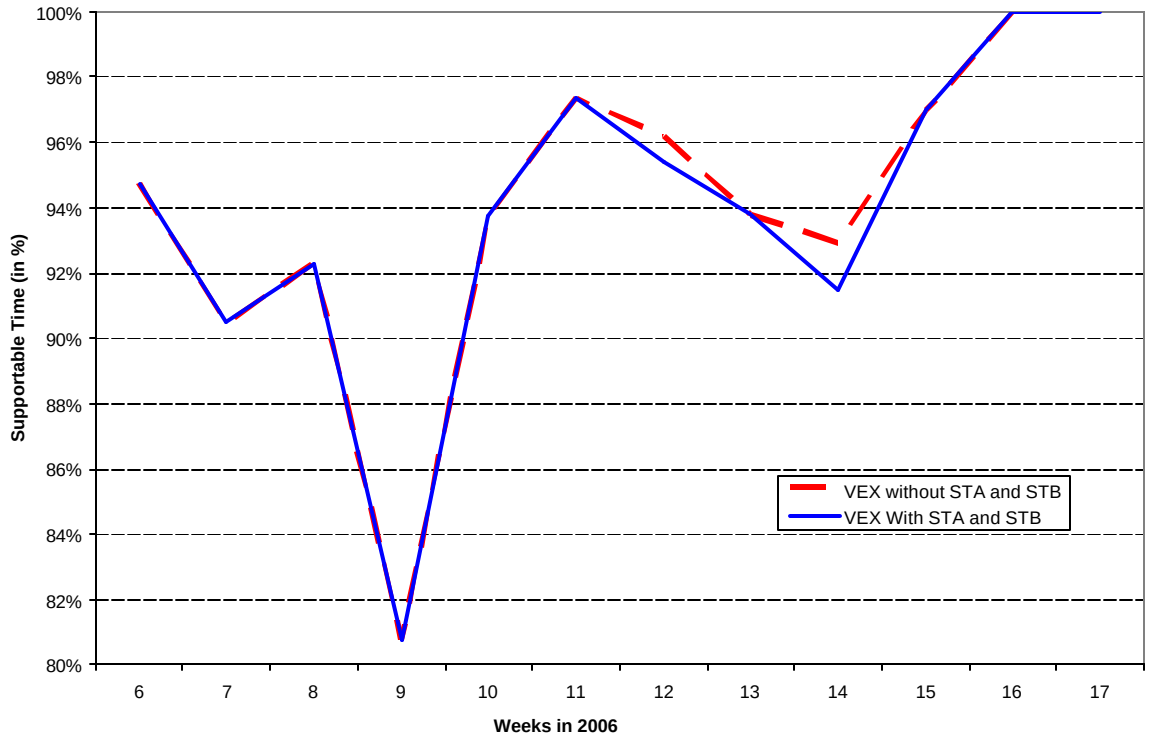
Concurrence:

Project Manager Date

VEX

VP Object	User	Resource	Durations Ave	Min	Calibration Pre	Post	January	February	March	April	May	June	July	August	September	October	November	December
2006																		
VEX	VEX Approach	34B2	4.0	4.0	1.00	0.25		1 1 2 5 4										
VEX	VEX Bistatic Test	DSS-43	9.0	8.0	2.00	1.00		1	1	1	1				1		1	
VEX	VEX Capture	DSS-34,65	8.0	4.0	1.00	0.25			2 3 4 3 4 1									
VEX	VEX Capture	DSS-34,15	8.0	4.0	1.00	0.25			1 4 3 4 3 2									
VEX	VEX Capture TCM	70M	9.0	8.0	1.00	0.25				1								
VEX	VEX DDOR	DSS-26 45	4.0	4.0	1.00	0.25	5	2 2 2 2 2 2 2 2										
VEX	VEX DDOR	DSS-25 45	4.0	4.0	1.00	0.25	5											
VEX	VEX DDOR	DSS-25 34,25 55	4.0	4.0	1.00	0.25			2 3 2 4									
VEX	VEX OCC Test	14/15,63 65	9.0	2.0	1.00	0.25	1	1	1	1	1							
VEX	VEX Occultation	DSS-14/15,63 65	4.0	4.0	1.00	0.25						1 1 1 1 1 1 1 1 1 1						2 1 2 1 2
VEX	VEX Solar Conj	DSS-14,63	10.0	4.0	1.00	0.25										2 3 2 3		
VEX	VEX Solar Conj	DSS-15,65	10.0	4.0	1.00	0.25										5 5 5 5		

Figure 2 **VEX Supportability With/Without STA and STB Missions**



Conclusion

Overall Venus Express is projected to receive on average above 90% of the requested time during the period from February to April 2006. During the period of STA and STB launch in week 06 of 2006, it is expected to receive 95% of the requested time. However in week 09

supportability falls below 85% due to contention with requirements supporting SOHO keyhole and MSGR cruise on the 34-meter subnet.

The levels of supportability for the VEX mission reported in this assessment is preliminary and may be effected by pending changes to the baseline mission set. It is recommended that this assessment be followed by an expanded study to include the actual VEX VOI and Capture requirements.

cc:
Art Andujo
David Morris
Dwight Holmes
Ernestine Hampton
Napoleon Lacey
Sandhya Guduru
Joaquin Retana
Gordon O'Brien